

COMMONWEALTH OF VIRGINIA
Department of Environmental Quality
Tidewater Regional Office

STATEMENT OF LEGAL AND FACTUAL BASIS

Hercules Incorporated
Courtland, Virginia
Permit No. VA-60188

Title V of the 1990 Clean Air Act Amendments required each state to develop a permit program to ensure that certain facilities have federal Air Pollution Operating Permits, called Title V Operating Permits. As required by 40 CFR Part 70 and 9 VAC 5 Chapter 80, Hercules Incorporated has applied for a Title V Operating Permit for its production facility in Courtland, Southampton County. The Department has reviewed the application and has prepared a draft Title V Operating Permit.

Engineer/Permit Contact:_____ Date:_____

Air Permit Manager:_____ Date:_____

Regional Director:_____ Date:_____

FACILITY INFORMATION

Permittee

Hercules Incorporated
Hercules Plaza
Wilmington, Delaware 19894

Facility

Hercules Incorporated
27123 Shady Brook Trail
Courtland, Virginia 23837-2034

AIRS ID No. 51-175-00012

SOURCE DESCRIPTION

SIC Code 2899 – Chemicals and Chemical Preparations, Not Elsewhere Classified.

The main process is called the Aquapel® process, a batch process that converts fatty acids to an alkyl ketene dimer, a sizing agent for the fine paper industry. The process involves several steps as described in the permit application, including information that qualifies as confidential business information (9 VAC 5-170-60 B). This Title V permit is written to contain no confidential business information because the contents of a Title V permit cannot be kept confidential (CAA Amendment 1990, Section 503(e)). Hence, process description is minimal in the permit; instead, the emissions sources are primarily identified as 19 groups of equipment with common functions, as seen below in the Emission Unit and Control Device Identification.

Wastewater from the Aquapel® process is treated by the Wastewater Neutralization process.

The facility is a Title V major source of volatile organic compounds, a non-VOC hazardous air pollutant, and volatile organic hazardous air pollutants. This source is located in an attainment area for all criteria pollutants. The facility was previously permitted under a NSR permit issued on 3/10/97, and amended on 5/17/02. The initial NSR permit dated 3/10/97 was triggered by the expansion of the Aquapel® process at the facility. That permit also included conditions on existing fuel burning equipment at the facility to cover the terms in the Consent Agreement and Order (CA&O) dated January 28, 1993, that was drafted jointly by the DEQ and Hercules, but was never signed or entered into the State Implementation Plan. The Title V permit application for the whole facility was received on 2/05/98, and deemed complete on the same day. In May 2001, the facility sold many of its assets to Eastman Chemical Resins, Inc. and Geo Specialty Chemicals, retaining only the Aquapel® process and parts of the Wastewater Treatment process that are necessary for the Aquapel® process. The revised Title V permit application for

the remaining facility was received on 2/04/02. The complete date of the permit application is still considered to be 2/05/98 because all the equipment was covered in the initial timely application. Therefore, the facility still qualifies for the permit shield and CAM exemption. The 3/10/97 NSR permit was amended on May 17, 2002, mainly to have the conditions on the fuel burning equipment removed for subsequent transfer to the permit of the new owner/operator, Eastman Chemical Resins, Inc. The Hercules' amended NSR permit was also written to contain as few confidential business information (CBI) as possible, while still addressing all air related operating permit issues, to facilitate the transfer of conditions to the Title V permit that cannot be kept confidential as discussed above. As a result, the HAPs are coded as X, Y, and Z to be defined in a separate addendum. The only CBIs remaining in the NSR permit are the size/rated capacity of equipment. Since the Title V permit has to be self-explanatory and suitable for public review, X is identified as a non-VOC HAP, and Y and Z are VOC-HAPs. The size/rated capacity of equipment is not listed except when there are applicable requirements such as in the case of tanks that are subject to NSPS Subpart Kb.

COMPLIANCE STATUS

The facility is inspected at least once a year. The last inspection on July 10, 2001 has found that all the permit conditions in the NSR permit dated 3/10/97 (now superseded by the 5/17/02 permit) were fully satisfied, and the facility was deemed to be in compliance.

EMISSION UNIT AND CONTROL DEVICE IDENTIFICATION

The following naming system was used to identify emission units, stacks/vents, and control equipment associated with each process. Two letters are used to identify each process: AQ for Aquapel® process, and WW for Wastewater Neutralization process. A third letter “E”, “S”, or “C” denotes an emission group, a stack/vent, or a control device, respectively. The next two numbers are consecutive numbers used for each category to indicate a unit or a group of units with common function. For example AQE01 represents the emission group in the first step of the Aquapel® process. Each emission unit in AQE01 is identified by its own equipment ID number. Stack/vents and control devices are always individual units, e.g. AQS01 and AQC01 are stack 01 and control device 01, respectively, hence, no further identification is necessary. Each stack/vent or control device may serve several emission groups. For example, AQC01 controls emissions from AQE02 to AQE08 with the common vent AQS01, while AQC02 and AQC03 (in series) control emissions from AQE12 to AQE18 with the common vent AQS02. Equipment to be operated consists of:

Emission group/ Unit ID	Stack/ Vent ID	Emission Unit Description	Size/Rated Capacity*	Pollution Control Device (PCD) Description	PCD ID	Pollutant Controlled	Applicable Permit Date
Aquapel® Process							
AQE01/	N/A	Raw material and scrubber storage tanks	-	N/A	N/A	N/A	May 17, 2002
To-be-installed		Fatty acid tank	75 m ³ to <151m ³	N/A	N/A	N/A	May 17, 2002
A-18	N/A	Fatty acid tank, 1990	75 m ³ to <151m ³	N/A	N/A	N/A	N/A
A-19	N/A	Fatty acid tank, 1991	75 m ³ to <151m ³	N/A	N/A	N/A	N/A
AQE02/	AQS01	Reactant storage tanks	-	Packed scrubber	AQC01	90 % control of Non-VOC HAP	May 17, 2002
To-be-installed	-	Reactant tank	-	-	-	-	May 17, 2002
AQE03/	AQS01	Reactors	-	Packed scrubber	AQC01	90 % control of Non-VOC HAP	May 17, 2002
R-110 & R-111	-	Two reactors, 1997	-	-	-	-	May 17, 2002

Emission group/ Unit ID	Stack/ Vent ID	Emission Unit Description	Size/Rated Capacity*	Pollution Control Device (PCD) Description	PCD ID	Pollutant Controlled	Applicable Permit Date
AQE04/	AQS01	Process tanks	-	Packed scrubber	AQC01	90 % control of Non-VOC HAP	May 17, 2002
T-112, T-113, T- 114, & T-115	-	Four process tanks, 1990- 1991	-	-	-	-	N/A
AQE05/	AQS01	Process tanks	-	Packed scrubber	AQC01	90 % control of Non-VOC HAP	May 17, 2002
T-118	-	Process tank, 1997	-	-	-	-	May 17, 2002
T-119	-	Process tank, 1999	-	-	-	-	May 17, 2002
T-116 & T-117	-	Two process tanks, 1990	-	-	-	-	N/A
AQE06/	AQS01	Stripper system	-	Packed scrubber	AQC01	90 % control of Non-VOC HAP	May 17, 2002
T-100	-	Aqueous solution tank, 1990	-	-	-	-	N/A
C-203	-	Stripper, 1994	-	-	-	-	N/A
C-213	-	Stripper, 1997	-	-	-	-	N/A
A-31	-	Recovered material tank, 1995	-	-	-	-	N/A
AQE07/	AQS01	Liquid handling basin	-	Packed scrubber	AQC01	90 % control of Non-VOC HAP	May 17, 2002
CIRCUL	-	Aqueous solution tank, 1985	-	-	-	-	N/A

Emission group/ Unit ID	Stack/ Vent ID	Emission Unit Description	Size/Rated Capacity*	Pollution Control Device (PCD) Description	PCD ID	Pollutant Controlled	Applicable Permit Date
AQE08/	AQS01	By-product recovery and storage system	-	Packed scrubber	AQC01	90 % control of Non-VOC HAP	May 17, 2002
T-108-6	-	Aqueous solution tank, 1998	40 to <75 m3	-	-	-	May 17, 2002
A-12	-	By-product tank, 1991	40 to <75 m3	-	-	-	N/A
A-13	-	By-product tank, 1991	40 to <75 m3	-	-	-	N/A
T-108-1	-	By-product tank, 1990	40 to <75 m3	-	-	-	N/A
A-29	-	By-product tank, 1993	40 to <75 m3	-	-	-	N/A
IRVIN	-	By-product tank, 1985	-	-	-	-	N/A
T-108-3	-	By-product tank, 1990	40 to <75 m3	-	-	-	N/A
T-108-5	-	Aqueous solution tank, 1997	-	-	-	-	May 17, 2002
T-108-6A	-	North Adsorber, 1994	-	-	-	-	N/A
T-108-6B	-	East Adsorber, 1985	-	-	-	-	N/A
T-108-6C	-	East Adsorber, 1985	-	-	-	-	N/A
AQE09/	N/A	Neutralization system	-	N/A	N/A	N/A	May 27, 2002
A-21	N/A	Water/Fatty acid crude, 1993	-	N/A	N/A	N/A	N/A
A-23	N/A	Water/Fatty acid crude, 2001	-	N/A	N/A	N/A	May 27, 2002
T-104-1	N/A	Neutralization Tank, 1997	-	N/A	N/A	N/A	May 27, 2002
NEUTRAL	N/A	Aqueous solution tank, 1990	-	N/A	N/A	N/A	N/A
AQE10/	N/A	VOC storage tanks	-	N/A	N/A	N/A	May 17, 2002
A-6	N/A	VOC storage tank, 1991	-	N/A	N/A	N/A	N/A
A-7	N/A	VOC storage tank, 1994	-	N/A	N/A	N/A	N/A
A-8	N/A	VOC storage tank, 1995	-	N/A	N/A	N/A	N/A
A-49	N/A	VOC storage tank, 1965	-	N/A	N/A	N/A	N/A

Emission group/ Unit ID	Stack/ Vent ID	Emission Unit Description	Size/Rated Capacity*	Pollution Control Device (PCD) Description	PCD ID	Pollutant Controlled	Applicable Permit Date
AQE11/	N/A	VOC storage tanks	-	N/A	N/A	N/A	May 17, 2002
A-16	N/A	VOC storage tank, 2001	-	N/A	N/A	N/A	N/A
A-17	N/A	VOC storage tank, 1994	-	N/A	N/A	N/A	N/A
A-5	N/A	VOC storage tank, 1991	-	N/A	N/A	N/A	N/A
AQE12/	AQS02	Reactors	-	Condenser and Carbon Adsorber in series	AQC02 and AQC03	95% control of VOC	May 17, 2002
R-41	-	Reactor, 1990	-	-	-	-	N/A
R-40	-	Reactor, 1997	-	-	-	-	May 17, 2002
A-33 ⁽¹⁾	-	Stripped fatty acid tank, 1965	-	N/A	N/A	N/A	N/A
AQE13/	AQS02	Centrifuge system	-	Condenser and Carbon Adsorber in series	AQC02 and AQC03	95% control of VOC	May 17, 2002
S-403-1	-	Small centrifuge, 1988	-	-	-	-	N/A
S-413-1	-	Large centrifuge, 1998	-	-	-	-	May 17, 2002
T-412-1	-	Centrifuge feed tank, 1989	-	-	-	-	N/A
AQE14/	AQS02	Still system	-	Condenser and Carbon Adsorber in series	AQC02 and AQC03	95% control of VOC	May 17, 2002
T-42	-	Crude product tank, 1990	-	-	-	-	N/A
A-45	-	Crude product tank, 1966	-	-	-	-	N/A
A-53	-	Mixed solvent tank, 1965	-	-	-	-	N/A
C-608-1	-	Still jets, 2000	-	-	-	-	May 17, 2002
S-611-2	-	Separator, 1990	-	-	-	-	N/A
S-614-2	-	Separator, 1990	-	-	-	-	N/A
S-620-2	-	Separator, 1996	-	-	-	-	N/A

Emission group/ Unit ID	Stack/ Vent ID	Emission Unit Description	Size/Rated Capacity*	Pollution Control Device (PCD) Description	PCD ID	Pollutant Controlled	Applicable Permit Date
AQE15/	AQS02	Recovery tanks	-	Condenser and Carbon Adsorber in series	AQC02 and AQC03	95% control of VOC	May 17, 2002
A-43	-	Recovery tank, 1990	-	-	-	-	N/A
A-44	-	Recovery tank, 1978	-	-	-	-	N/A
A-80 & A-81	-	Recovery tanks, 1979	-	-	-	-	N/A
T-503-1	-	Recovery tank, 1997	-	-	-	-	May 17, 2002
AQE16= AQC02	AQS02 & AQS04	Condenser, 1990	-	Carbon Adsorber, January 1996	AQC03	95% control of VOC	May 17, 2002
AQE17/	AQS02	Batch still system	-	Condenser and Carbon Adsorber in series	AQC02 and AQC03	95% control of VOC	May 17, 2002
A-79	-	VOC tank, 1991	-	-	-	-	N/A
A-84	-	VOC tank, 1991	-	-	-	-	N/A
A-83	-	Overhead water tank, 1991	-	-	-	-	N/A
A-85	-	Scrap tank, 1991	-	-	-	-	N/A
A-86 & A-86A	-	Two VOC tanks, 1981	-	-	-	-	N/A
A-88	-	Overflow tank, 1965	-	-	-	-	N/A
A-90	-	Batch still, 1965	-	-	-	-	N/A
AQE18/	AQS02	VOC stripper system	-	Condenser and Carbon Adsorber in series	AQC02 and AQC03	95% control of VOC	May 17, 2002
A-87A	-	VOC tank, 1998	40 to <75 m3	-	-	-	May 17, 2002
A-87	-	VOC tank, 1981	-	-	-	-	N/A
A-89	-	Still bottoms, 2000	-	-	-	-	May 17, 2002
S-513-8	-	VOC stripper, 1990	-	-	-	-	N/A
S-510-2	-	Distillate separator, 1965	-	-	-	-	N/A
A-89B ⁽¹⁾	-	Still bottom tank, 1997	-	N/A	N/A	N/A	May 17, 2002

Emission group/ Unit ID	Stack/ Vent ID	Emission Unit Description	Size/Rated Capacity*	Pollution Control Device (PCD) Description	PCD ID	Pollutant Controlled	Applicable Permit Date
AQE19/	AQS03	Pelletizer system	-	N/A	N/A	N/A	May 17, 2002
T-717-1	-	Dowfrost refrigerated water tank, 1996	-	N/A	N/A	N/A	N/A
T-103	-	Dowfrost refrigerated water tank, 1966	-	N/A	N/A	N/A	N/A
Pelletizer 1 & Pelletizer 2	-	Two pelletizers, 1997	-	N/A	N/A	N/A	May 17, 2002
T-65-1	-	Pelletizer feed tank, 1996	-	N/A	N/A	N/A	May 17, 2002
Wastewater Neutralization Process							
WWE10/	N/A	Combined Basin, 1955	-	N/A	N/A	N/A	N/A
WWE11/	N/A	Wastewater neutralization tanks	-				
T-702	N/A	Tank, 1998	-	N/A	N/A	N/A	N/A
T-703	N/A	Tank, 1994	-	N/A	N/A	N/A	N/A
T-704	N/A	Tank, 1996	75 m ³ to <151m ³	N/A	N/A	N/A	N/A

*The Size/Rated capacity and PCD efficiency is provided for informational purposes only, and is not an applicable requirement.

⁽¹⁾ The tank is not connected to AQC02 and AQC03.

The above Table needs additional explanation. The Title V permit application identifies emission units primarily as groups of equipment with the same function, not as individual pieces of equipment. For example, AQE01 was described in the permit application as “raw material and scrubber storage tanks”, and AQE02 as reactant storage tanks. The identification method was based on the facility’s interpretation of the US EPA’s July 10, 1995 White Paper for Streamlined Development of Part 70 Permit Applications, Section II. B.4 on Generic Grouping of Emission Units and Activities. This interpretation appears to be acceptable in this case. However, there are instances when federally enforceable applicable requirements apply to individual units, for example, NSPS Subpart Kb applicability to certain tanks. Also, the underlying NSR permit dated 5/17/02 and its predecessor, NSR permit dated 3/10/97, identifies the equipment in groups as well as individually. For examples, the emission units permitted for installation were identified individually while the equipment permitted for modification was identified by “systems” or “areas”, i.e. groups; emission controls and limitations were addressed in groups while the control device is addressed individually. Therefore, it was decided that both group name and individual unit identification number within each group are included in the above Table with the applicability of the NSR permit indicated accordingly. Please note that all emission groups in the Aquapel® process are included under the process-wide emission limits (Condition III.A.6).

Every effort was made to reconcile the equipment list for the Aquapel® process in NSR permit with the one in the Title V permit application. Numerous additional information requests to the facility were made and answers were provided in amendments dated 9/13/00, 10/02/00, 10/27/00, 11/16, 11/21/00, 12/27/00, 1/29/01, and 1/30/01, as well as via telephone calls that are documented in a telephone log. Following the sale of parts of the facility to Eastman Chemical Resins, Inc. and Geo Specialty Chemicals in May 2001, the revised Title V permit application dated 1/31/02 was submitted with updated information. Additional information dated 6/17/02 and 7/24/02 to expand the list of insignificant emission units were also received. The above Table includes all emission units unless they are listed as Insignificant Emission Units. Please note that there are one fatty acid storage tank and one reactant storage tank still to be installed in groups AQE01 and AQE02, respectively. The size/rated capacity of the equipment is confidential business information, hence, not listed unless it is necessary for indication of applicable requirements. For examples, for tanks that are subject to NSPS Subpart Kb requirements, the applicable storage capacity range in the Subpart is provided.

EMISSIONS INVENTORY

A copy of the 2001 annual emission statement is attached as Attachment A. Please note that the document covers the whole facility including several processes that were no longer owned and operated by Hercules Incorporated after May 2001. Emissions from the Aquapel® process and the wastewater treatment process are gleaned from the document and summarized in the following tables. The amounts from the wastewater treatment process include the portion from the biological treatment process up to May 2001 when it was sold to Eastman. Also, the amounts of HAPs as VOCs were not separated out from the VOCs amounts in the Attachment. Therefore, they had to be obtained separately from the facility on 7/24/02. It was observed that all emissions from Aquapel® are below the 5/17/02 permit limits.

2001 Actual Emissions

Criteria Pollutant Emission in Tons/Year				
Emission Unit	VOC	SO ₂	PM ₁₀	NO _x
Aquapel® Point Sources	1.72			
Aquapel® Fugitives	34.14			
Aquapel® process Total	35.86			
Wastewater Neutralization Process Total	13.31			
Grand Total	49.17			

Hazardous Air Pollutant Emissions in Tons/Year		
Emission Unit	HAPs (as VOCs)	HAP (Non-VOC)
Aquapel® Point Sources	1.53	1.32
Aquapel® Fugitives	33.40	0.70
Aquapel® Process Total	34.93	2.02
Wastewater Neutralization Process Total		9.14
Grand Total	34.93	11.16

AQUAPEL® PROCESS APPLICABLE REQUIREMENTS

Limitations

The following applicable limitations are State BACT requirements (9 VAC 5-50-260) from conditions 3, 5, and 11-13 of the NSR amended permit dated 5/17/02 (Attachment B):

Condition 3: Requires a packed scrubber (AQC01) to control emissions of the non-VOC HAP (coded X in the NSR permit) from the equipment groups AQE02 to AQE08 of the Aquapel® process. The maximum concentration of X in the water feed to the scrubber is limited to 4% by weight, and the minimum water flow is limited to 50 gallons per minute, to ensure the scrubber efficiency.

Condition 5: Requires a condenser (AQC02) and a carbon adsorber (AQC03) in series to control VOC emissions from the equipment groups AQE12 to AQE18 (with the exception of tanks A-33 of AQE12, and A-89B of AQE18 which are not connected to the control equipment due to low expected emissions). Please note that the word “adsorber” is misspelled as “absorber” in the NSR permit. The condenser shall be operated at = 36 °F at the brine inlet and the adsorber will be regenerated by steam every 12-hours. The maximum VOC concentration from the carbon adsorber outlet (AQS02) is limited to 50,000 ppmv as measured by a calibrated Gas Chromatography Instrument. The instrument detector type is not specified to give the facility flexibility, however, it shall be suitable for the analysis of target VOC compounds, properly calibrated and corrected, using manufacturer-supplied correction factors. The list of target VOC compounds shall be approved by the Director, Tidewater Regional Office, based on process knowledge. This slight variation from the NSR permit is to avoid naming Y and Z in the Title V permit. Please note that the condenser itself has a vent AQS04 that is necessary for start-up and shut-down.

Condition 11: Limits point emissions from the packed scrubber outlet (Stack No. AQS01) to:

Non-VOC HAP (X)	0.4 lbs/hr	1.9 tons/yr
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Compliance to the above X emission limits is assured if the facility's records show compliance with the limits of 4% X in the water feed to the scrubber and the minimum water flow rate of 50 gallons per minute (Condition 3). That is because the above limits are equivalent to the controlled maximum potential to emit, as summarized below:

- In the NSR permit application, it was shown that the concentration of X emitted from the packed scrubber vent was measured with and without the circulation of the scrubber water containing 4% X at a design flow rate at 50-100 gallons/minute. The results indicate a control efficiency of 90%. Therefore, the non-VOC HAP concentration in the water feed to the scrubber is limited to = 4% and water flow rate is limited to = 50 gallons/minute to keep a minimum of 90% control efficiency.

- Uncontrolled X emissions calculated from the vent flow rate, the weighted-average X concentration, and continuous operation of 8,760 hrs per year, were 37,177 lbs X per year. At 90% control, the controlled emissions is $37,177 \text{ lbs/yr} \times (100-90)\% \times 1 \text{ ton}/2,000 \text{ lbs} = 1.9 \text{ tons/yr}$. Because the X emissions were calculated for continuous operation of 8,760 hrs per year, they are equivalent to the maximum potential to emit.
- The hourly controlled emission is $37,177 \text{ lbs/yr} \times 1 \text{ yr} / 8760 \text{ hr} = 0.4 \text{ lbs/hr}$. This averaging over 8,760 hrs per year is acceptable because the weighted-average X concentration in the previous calculation was calculated per reaction batch that is completed within one hour.

Condition 12: Limits point emissions from the condenser/carbon adsorber outlet to:

VOCs	2.2 lbs/hr	9.7 tons/yr
HAPs (as VOCs)	2.2 lbs/hr	9.7 tons/yr

Note that the two individual HAPs listed in the NSR permit as Y and Z have been combined under "HAPs as VOCs" to be more self-explanatory without defining the two compounds which are confidential business information. The combination is appropriate because both are emitted from the same vent and subject to the same monitoring requirements as discussed under Monitoring and Recordkeeping.

Compliance to the above VOCs and HAPs (as VOCs) emission limits is assured because they were derived from the maximum potential to emit at 8760 hours of operation per year and 95% control efficiency of the condenser/adsorber. The VOC concentration limit of 50,000 ppmv at the carbon adsorber vent (Condition 5) ensures 95 % control efficiency ($100\% - [(50,000/1,000,000) \times 100\% = 95\%]$).

The uncontrolled emissions (maximum potential to emit) were calculated from the vent exhaust rate and partial pressure of stream components, using a typical header temperature of 140 °F before the condenser. For example, the results for uncontrolled emissions for one of the two VOC HAPs were 181,096 lbs/yr (90.5 tons/yr) and 20.7 lbs/hr. Hence, the emission limits, assuming 95% control efficiency are:

$$\begin{array}{lcl} 181,096 \text{ lbs/yr} \times (100-95)\% \times 1 \text{ ton}/2,000 \text{ lbs} = & 4.5 \text{ tons/yr} \\ 20.7 \text{ lbs/hr} \times (100-95)\% = & 1.0 \text{ lbs/hr} \end{array}$$

The condenser brine inlet temperature is typically at 32-36 °F. Controlled emissions calculated with the condenser at the worst case brine inlet temperature of 36 °F for the above case was found to be 19,237 lbs/yr (9.6 tons/yr), indicating 89.4% control. With the typical control efficiency of 99% for the carbon adsorber that follows the condenser, the overall control efficiency could be as high as

$$[1 - [(100-89.4)/100 \times (100-99)/100]] \times 100 = 99.9\%.$$

Therefore, the overall control efficiency assumption of 95% is conservative, and compliance is assured if the condenser inlet temperature is kept at = 36 °F, and the carbon adsorber is regenerated every 12 hours. This regeneration cycle time has been documented by the facility as sufficient to prevent breakthrough.

Note that the total HAPs as VOCs emissions are the same as the total VOC emissions because the contribution from other components such as fatty acids and the alkyl ketene dimer product is relatively negligible.

Condition 13: Limit total emissions (points and fugitive sources) for the Aquapel® process:

VOC	32.6 lbs/hr	142.9 tons/yr
Non-VOC HAP (X)	2.3 lbs/hr	10.3 tons/yr
HAPs as VOCs (Y and Z)	32.4 lbs/hr	142.1 tons/yr
Total Hazardous Air Pollutants	34.7 lbs/hr	152.7 tons/yr

The above limits for the Aquapel® process were also developed from the maximum potential to emit of all point and fugitive sources in the process, using 8,760 hours of operation per year or the maximum production from 48.6 million pounds fatty acid raw material per year, as appropriate:

- For VOCs and HAPs as VOCs, point sources include the emissions from the carbon adsorber (calculated above) and from tanks. The latter emissions were estimated based on AP-42, 10/92, Section on Storage of Organic Liquids. Fugitive emissions from transfer lines (via valves, flanges, pumps, open ends, pressure relief valves...) for fatty acid compounds were determined using SOCMI factors and methodology. For the HAPs as VOCs, process material balance was used as it generally gave higher results than did the SOCMI factors. The material balance was made by subtracting both the residual amounts in the product and the point emissions from the material consumption.
- For the non-VOC HAP (X), point sources include the emissions from the packed scrubber (calculated above) and from tanks. The latter emissions were calculated from AP-42, 10/92, Section on Storage of Organic Liquids. Fugitive emissions of X are determined using SOCMI factors and methodology, except that for open top tanks (e.g. the neutralization basin in AQE09), the EPA SIMS program is used.
- Therefore, compliance to the control requirements (Conditions 3 and 5) and the throughput limit (Condition 10, discussed below), demonstrated via the monitoring and record keeping, ensures compliance to the emission limits.

The following applicable requirement in the 5/17/02 NSR permit Condition 10 is based on 9 VAC 5-80-10H (Standards for granting permits, new and modified stationary sources):

Condition 10: Limits annual usage of fatty acid in the Aquapel® process to 48.6 million pounds, calculated monthly as the sum of each consecutive 12-month period. Fatty acid usage is directly related to the final production capacity that is a confidential business information. This throughput limit was also based on a maximum operation of 8,760 hours per year where the production batches were run continuously. Therefore, compliance to this limit is another assurance that the emission limits are not exceeded.

The following applicable requirement in the 5/17/02 NSR permit Condition 16 is based on 9 VAC 5-80-10K- Permit Invalidation, Revocation, and Enforcement:

Condition 16: Addresses the invalidation of the permit, not covered in the General Condition VII.V in the Title V permit (Permit Revocation or Termination for Cause). As some equipment installations/modifications remain to be carried out, this condition limits the time that the permit to install or modify remains valid. The permit to install and modify equipment for the Aquapel® process shall become invalid, unless an extension is granted by the DEQ, if:

- a. A program of continuous installation/modification is not commenced before the latest of the following:
 - i. 18 months from the date of the NSR permit (5/17/02);
 - ii. Nine months from the date that the last permit or other authorization was issued from any other governmental agency;
 - iii. Nine months from the date of the last resolution of any litigation concerning any such permits or authorization; or
- b. A program of installation/modification is discontinued for a period of 18 months or more, or is not completed within a reasonable time, except for a DEQ approved period between phases of a phased construction project.

Note that there are no visible emission limits because the process vents/ stacks should not result in visible emissions.

Monitoring and Recordkeeping

The monitoring and recordkeeping requirements in Conditions 4, 6, and 15 of the 5/17/02 NSR permit have been written with extensive changes from the initial 3/10/97 permit in anticipation of their transfer to the Title V permit that must meet Part 70 requirements. The results were that many of the monitoring requirements were newly added and periodic monitoring of the control equipment has also been added to ensure compliance to the emissions limits. Therefore, the Title V requirements are essentially the same as in the 5/17/02 NSR permit as follows:

Condition 4:

- Monitoring: The packed scrubber is equipped with a flow meter with low flow alarm to ensure that the scrubbing liquid is circulating at a flow rate = 50 gallons/minute. The flow rate shall be continuously measured (in gallons/minute) and recorded. The alarm will sound when the flow rate fell below the minimum value, and the process shall be suspended until the minimum flow rate is achieved.
- Periodic monitoring: The permittee will sample the water feed to the packed scrubber at least twice a calendar week to analyze for percent by weight of the non-VOC HAP (X). This will demonstrate compliance with the 4% by weight concentration limit.

Condition 6:

- Monitoring: The condenser shall be equipped with a temperature measuring device at the brine inlet to continuously monitor and record the operating temperature of the counter-current flow condenser. Please note that the high temperature alarm requirement is not in the NSR permit but added to the Title V permit to further ensure compliance. The facility has installed the alarm.

If the operating temperature of the condenser increases to above 36°F, the alarm is triggered, and the permittee shall take corrective action by manually reducing the regeneration cycle time of the carbon adsorber to ensure that the required combined control efficiency is achieved. If the condenser temperature cannot be lowered to = 36°F within 4 hours, the process areas AQE12-AQE18 (except for two tanks, Unit Ref. No. A-33 and A-89B, respectively, that are not connected to the condenser) shall be suspended until the problem can be corrected.

- Monitoring: The regeneration cycle of the carbon adsorber (Unit ref. No. AQC03) shall be recorded.
- Periodic monitoring: The permittee will determine the VOC concentration at the carbon adsorber vent at least once per calendar quarter by using a Gas Chromatographic Instrument to demonstrate compliance with the 50,000 ppmv limit. The instrument detector shall be suitable for the analysis of target VOC compounds, properly calibrated and corrected, using manufacturer-supplied correction factors. The list of target VOC compounds shall be approved by the Director, Tidewater Regional Office, based on process knowledge. This is to avoid naming the compounds, which are confidential business information. The test frequency was deemed sufficient in addition to the continuous

monitoring of the brine inlet temperature monitoring to ensure it is = 36°F and the regeneration of the carbon adsorber every 12 hours.

Condition 15:

- Recordkeeping: The permittee shall keep records of all continuous monitoring required above: water flow rate for the packed scrubber, temperature of the brine inlet to the condenser, and the regeneration cycles of the carbon adsorber.
- Recordkeeping: The permittee shall keep records of all periodic monitoring required above on the water feed to the packed scrubber and the VOC emissions from the carbon adsorber.
- Recordkeeping: The permittee shall also keep records of the annual throughput of fatty acid, the annual point emissions and annual total emissions (points and fugitive sources) for VOC, the non-VOC HAP, and HAPs as VOCs. Those recorded items will be calculated monthly as the sum of each consecutive 12-month period to demonstrate compliance with all limitation conditions.
- Recordkeeping: The permittee shall keep records of all maintenance.
- Recordkeeping requirements of New Source Performance Standards (NSPS) Subpart Kb, sections 40 CFR 60.116b (a) and (b) were determined to be applicable to several tanks in emission groups AQE01 (Tanks A-18, A-19, and the to-be-installed fatty acid tank), AQE08 (Tanks A-12, A-13, A-29, T-108-1, T108-3 and T108-6), and AQE18 (Tank A-87A). Those tanks were installed after 7/23/84, and contain volatile organic liquid (VOL). Although the VOL concentration can be very low in some of the tanks, NSPS Subpart Kb does not exclude them (according to, for example, Applicability Determination Index Control Number 9700144). The tanks in AQE08 and AQE18 are in the 40 m³ (10,569 gallons) to <75 m³ (19,817 gallons) size range. The tanks in AQE01 have capacity greater than 75 m³ but smaller than 151 m³ (39,898 gallons), and store fatty acid with a maximum true vapor pressure lower than 15.0 kPa (2.16 psi). Therefore, the permittee will keep readily accessible records showing the dimensions of the tanks and an analysis showing the capacity of the tanks. This record shall be kept for the life of each tank. There are no additional requirements for the tanks in AQE08 and AQE18, however, for the above AQE01 tanks, if the contents are changed to a VOL with a maximum true vapor pressure greater than or equal to 15.0 kPa, more recordkeeping requirements are applicable per 40 CFR 60.116b (c). Please note that some of the above tanks were not identified as Kb tanks in the NSR permit.

Testing

Beside the monitoring requirements specified above, the permit does not require source tests.

Condition 9 of the 5/17/02 NSR permit requires the permittee to have testing/monitoring ports available when requested. A table of test methods has been included in the permit if testing is performed. The Department and EPA have authority to require testing not included in this permit if necessary to determine compliance with an emission limit or standard.

Reporting

Condition 14: As the permittee has not completed the installation of two tanks permitted in the 5/17/02 NSR permit, initial notifications of the actual date of installation and the actual start-up date of the units are required within 10 days of such date as in Condition 14 of the permit.

The permittee will include the periodic monitoring results (twice weekly test on the non-VOC HAP concentration in the water tank feeding the scrubber water, and the quarterly test on the VOC emitted from the carbon adsorber vent) in the semi-annual monitoring reports required under General Conditions, Condition number VII. C.3.

Streamlined Requirements

The following conditions in the 05/17/02 NSR permit have not been included for the reasons provided:

Conditions 7 and 8 that cautioned the facility that reactivation of any of the deactivated or old replaced units may require a permit, have the same intent as the Title V General Condition Section VII.J.

Conditions 17 to 25 are general conditions that are addressed under Title V General Conditions Section VII.

Inapplicable Requirements

New Source Performance Standard Requirements for Volatile Organic Liquid Storage Vessels for which construction, reconstruction, or modification commenced after July 23, 1984, in 40 CFR 60 Subpart Kb do not apply to any of the Aquapel® process tanks other than those addressed in the record keeping requirements because they do not store volatile organic liquids, or because of their earlier installation date, and/or smaller size than the affected sizes.

WASTEWATER NEUTRALIZATION PROCESS APPLICABLE REQUIREMENTS

Limitations

There are no specific applicable limitations.

Monitoring and Recordkeeping

- Recordkeeping: The recordkeeping requirements of New Source Performance Standards Subpart Kb, sections 40 CFR 60.116b (a) and (b) were determined to be applicable to tank T-704 in the emission group WWE-11. The tank has a capacity between the range of 75 m³ (19,817 gallons) to < 151 m³ (39,898 gallons) and stores wastewater containing a small concentration of VOL that has a maximum true vapor pressure lower than 15.0 kPa (2.16 psi). The permittee will keep readily accessible records showing the dimensions of the tanks and an analysis showing the capacity of the tanks. This record shall be kept for the life of each tank. In addition, if the content of tank T-704 is changed to a VOL with a maximum true vapor pressure greater than or equal to 15.0 kPa, more recordkeeping requirements are applicable per 40 CFR 60.116b (c).

Testing

The permit does not require source tests.

Reporting

There are no applicable reporting requirements.

Inapplicable Requirements

New Source Performance Standard (NSPS) Requirements for Volatile Organic Liquid Storage Vessels for Which Construction, Reconstruction, or Modification commenced after July 23, 1984, in 40 CFR 60 Subpart Kb does not apply to the tanks other than T-704 of the Wastewater Neutralization Process because of their earlier installation dates and/or smaller size than the affected sizes.

GENERAL CONDITIONS

The permit contains general conditions required by 40 CFR Part 70 and 9 VAC 5-80-110, that apply to all Federal Operating Permit sources. These include requirements for submitting semi-annual monitoring reports and an annual compliance certification report. The permit also requires notification of deviations from permit requirements or any excess emissions, including those caused by upsets, within one business day.

Comments on General Conditions

B. Permit Expiration

This condition refers to the Board taking action on a permit application. The Board is the State Air Pollution Control Board. The authority to take action on permit application(s) has been delegated to the Regions as allowed by ' 2.1-20.01:2 and ' 10.1-1185 of the *Code of Virginia*, and the "Department of Environmental Quality Agency Policy Statement NO. 3-2001".

This general conditions cites the entire Article(s) that follow:

B.2. Article 1 (9 VAC 5-80-50 et seq.), Part II of 9 VAC 5 Chapter 80. Federal Permits for Stationary Sources

B.3. Article 1 (9 VAC 5-80-50 et seq.), Part II of 9 VAC 5 Chapter 80. Federal Permits for Stationary Sources

This general condition cites the sections that follow:

- B. 9 VAC 5-80-80. "Application"
- B.2. 9 VAC 5-80-150. "Action on Permit Applications"
- B.3. 9 VAC 5-80-80. "Application"
- B.4. 9 VAC 5-80-80. "Application"
- B.4. 9 VAC 5-80-140. "Permit Shield"
- B.5. 9 VAC 5-80-80. "Application"

F. Failure/Malfunction Reporting

Section 9 VAC 5-20-180 requires malfunction and excesses emissions reporting within 4 hours. Section 9 VAC 5-80-250 also requires malfunction reporting; however, reporting is required within 2 days. Section 9 VAC 5-20-180 is from the general regulations. All affected facilities are subject to this section including Title 5 facilities. Section 9 VAC 5-80-250 is from the Title 5 regulations. Title 5 facilities are subject to both Sections. A facility may make a single report that meets the requirements of 9 VAC 5-20-180 and 9 VAC 5-80-250. The report must be made within 4 daytime business hours of the malfunction.

Please note there is one proposed regulation change that could affect this condition. The requirement listed in section 9 VAC 5-20-180 to report excesses emissions within 4 business hours may be changed to require reporting of excess emissions within 6 hours.

This general condition cites the sections that follow:

- F. 9 VAC 5-40-50. Notification, Records and Reporting
- F. 9 VAC 5-50-50. Notification, Records and Reporting

U. Malfunction as an Affirmative Defense

The regulations contain two reporting requirements for malfunctions that coincide. The reporting requirements are listed in section 9 VAC 5-80-250 and 9 VAC 5-20-180. The malfunction requirements are listed in General Condition U and General Condition F. For further explanation see the comments on General Condition F.

This general condition cites the sections that follow:

- U.2.d. 9 VAC 5-80-110. Permit Content
- U.2.d. 9 VAC 5-20-180. Facility and Control Equipment Maintenance or Malfunction

STATE ONLY APPLICABLE REQUIREMENTS

The following Virginia Administrative Codes have specific requirements only enforceable by the State and have been identified as applicable:

- 9 VAC 5-40-130 et seq. (Rule 4-2), and 9 VAC 5-50-130 et seq. (Rule 5-2): Emission standards for odor.

FUTURE APPLICABLE REQUIREMENTS

The facility has identified that it may be subject to future Miscellaneous Organic Chemical Production and Processes MACT (MON, 40 CFR 63 Subpart FFFF, proposed April 4, 2002), and Hydrochloric Acid Production MACT (40 CFR 63 Subpart NNNNN, proposed September 18, 2001).

Note that the facility will not be subject to the New Source Performance Standard for Volatile Organic Compound Emissions From the Synthetic Organic Chemical Manufacturing Industry Wastewater (40 CFR 60 Subpart YYY, proposed September 12, 1994) because the facility does not produce any of the SOCMI chemicals listed in Table 1 of the proposed rule as primary products.

FACILITY-WIDE INAPPLICABLE REQUIREMENTS

The following NSPS or MACT requirements have been determined to be inapplicable to the facility with the given reason:

- NSPS for VOC Emissions from the Synthetic Organic Chemical Manufacturing Industry (SOMCI) Air Oxidation Unit Processes in 40 CFR 60 Subpart III: The facility does not have any SOCMI emission units that meet the definition of "air oxidation process" in 40 CFR 60.611.
- NSPS for VOC Emissions from SOCMI Distillation Operations in 40 CFR 60 Subpart NNN: The facility does not produce any chemicals listed in 40 CFR 60.667.
- NSPS for VOC Emissions from SOCMI Reactor Processes in 40 CFR 60 Subpart RRR: The facility does not produce any chemicals listed in 40 CFR 60.707.
- NSPS for Equipment Leaks of VOC in the SOCMI: The facility does not produce any chemicals listed in 40 CFR 60.489 as intermediates or final products.
- Hazardous Organic NESHAP (HON) MACT in 40 CFR 63 Subparts F, G, H, and I: The facility does not meet the criteria of 40 CFR 63.100 (b)(1) to (3).
- Cooling Tower MACT in 40 CFR 63 Subpart Q: The facility has never used chromium-based water treatment chemicals in the cooling towers.

Additionally, Emission Standards For Volatile Organic Compound Storage and Transfer Operations, 9 VAC 5-40-3410 et seq. (Rule 4-25) do not apply to the facility because the facility is located in Southampton County which is not a VOC control area (9 VAC 5-20-206).

INSIGNIFICANT EMISSION UNITS

The insignificant emission units are presumed to be in compliance with all requirements of the Clean Air Act as may apply. Based on this presumption, no monitoring, recordkeeping or reporting shall be required for these emission units in accordance with 9 VAC 5-80-110.

The following emission units are deemed insignificant in the permit application and its amendments:

Emission Unit No.	Emission Unit Description	Citation	Pollutant(s) Emitted
Aquapel® process			
AQE01/ A-3, A-4, & A-15	Three fatty acid tanks, 1965	9 VAC 5-80-720 B 2	VOC
T-501-1A & T-501-1B	Two by-product storage tanks, 1993	9 VAC 5-80-720 B 5	Non-VOC HAP
AQE02/ A-1 A-1A A-0	Reactant tank, 1965 Reactant tank, 1989 Reactant tank, 1994	9 VAC 5-80-720 B 5 9 VAC 5-80-720 B 5 9 VAC 5-80-720 B 5	Non-VOC HAP Non-VOC HAP Non-VOC HAP
AQE08/ A-10 & A- 11 A-25 A-26 T-707-1	Two by-product tanks, 1991 Dilution water tank, 1994 Aqueous solution tank, 1995 Hot water tank, 1987	9 VAC 5-80-720-B 2 9 VAC 5-80-720-B 2 9 VAC 5-80-720-B 5 9 VAC 5-80-720-A 42	VOC VOC Non-VOC HAP None
AQE09/ A-2	Caustic solution tank, 2001	9 VAC 5-80-720-A 42	None
AQE19/ A-63 A-61 & A- 62	Rework tank, 1966 Two product tanks, 1966	9 VAC 5-80-720-B 5 9 VAC 5-80-720-B 5	VOC HAP VOC HAP
Wastewater Neutralization Process			
No insignificant units identified			
Emission	Emission Unit	Citation	Pollutant(s)

Unit No.	Description		Emitted
Facility-wide			
Unassigned	Warehousing/storage/ offices	9 VAC 5-80-720 A and 9 VAC 5-80-720 B	All criteria pollutants

¹The citation criteria for insignificant activities are as follows:

9 VAC 5-80-720 A - Listed Insignificant Activity, Not Included in Permit Application

9 VAC 5-80-720 B - Insignificant due to emission levels

9 VAC 5-80-720 C - Insignificant due to size or production rate

CONFIDENTIAL INFORMATION

The source submitted a list of proposed confidential business information dated February 3, 1998, and received on February 5, 1998. The DEQ concurred with the proposed list of information in a DEQ letter dated February 23, 1998. The Title V permit was written to be self-explanatory but without any confidential business information so that it is suitable for public review.

PUBLIC PARTICIPATION

The proposed permit will be placed on public notice in the Tidewater News from August 29, 2002 to September 28, 2002.